

Engine 616 617

## Test values

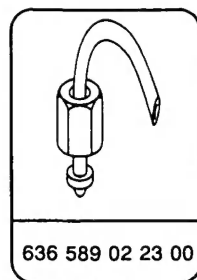
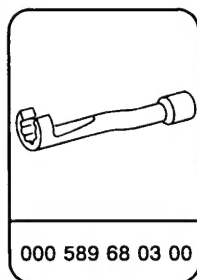
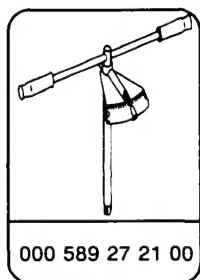
Engine	616,617
Start of delivery BTDC <sup>1)</sup>	24° ± 1°

<sup>1)</sup>Note: Pull regulating lever of injection pump to full load stop during measurement and disconnect vacuum hose at vacuum unit.

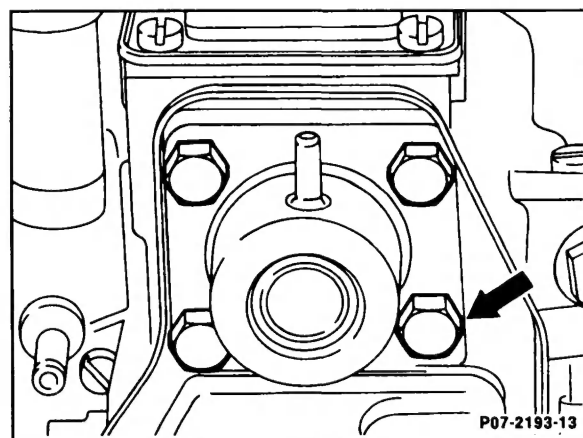
## Torque specifications (Nm)

Pipe connection	40
-----------------	----

## Special tools



Disconnect vacuum hose at vacuum unit.



Unscrew pipe connection (1) of first injection pump element, remove compression spring and delivery valve.

Install pipe connection (1) without compression spring and delivery valve.

**Attention!** Do not slacken barrel-and-valve assembly (2).

Screw on overflow pipe.

**Pull** regulating lever of injection pump to **full load stop during measurement.**

Turn crankshaft in direction of rotation until fuel just stops dripping.

This position represents start of delivery.

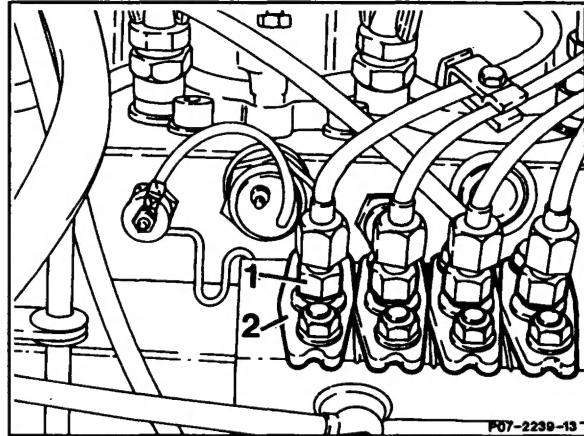
If injection timing has to be adjusted, refer to adjustment instructions

Remove overflow pipe and unscrew pipe connection.

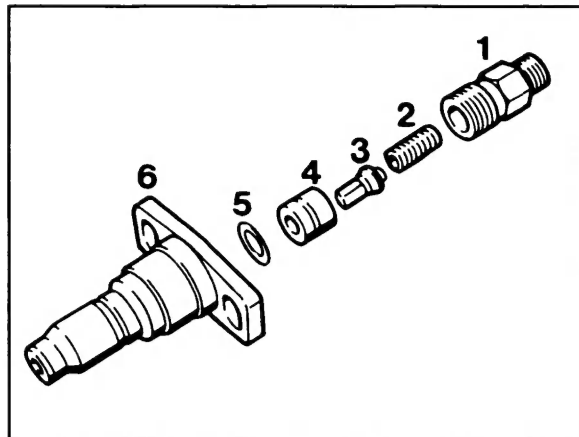
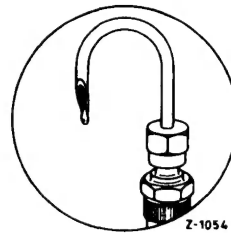
Fit delivery valve, compression spring and pipe connection.

Torque pipe connection in one movement to 40-50 Nm.

Run engine and check for leaks. If a pipe connection leaks, it must be replaced. When fitting a new pipe connection, use **new** copper sealing ring under delivery valve holder.



1 Pipe connection 2 Barrel-and-valve assembly



Engine 601 602 603

## Test values

Model year	Indirect injection timing (after TDC)	
	RI (reference impulse) checking value	RI (reference impulse) adjusting value
1984-89	$15^{\circ} \pm 1^{\circ}$	$15^{\circ}$
starting 1990	$14^{\circ} + 0.5^{\circ}$	$14^{\circ} + 0.5^{\circ}$

## Tightening torques (reference values)

Nm

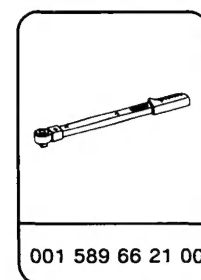
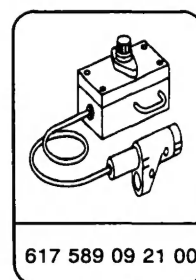
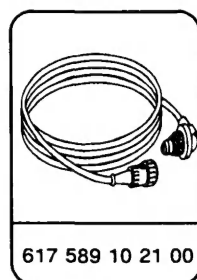
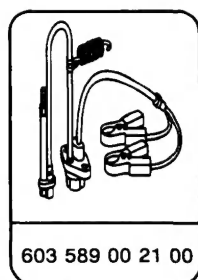
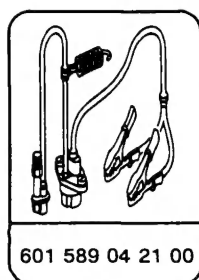
Closing plug to regulator (measuring point)

30-35

Injection pump flange

20-25

## Special tools



## Equipment

### For use with adapter

Digital testers

e.g. Bosch, ETD 019.00

e.g. Hartmann & Braun, EOMT 3

## Equipment

### For use without adapter

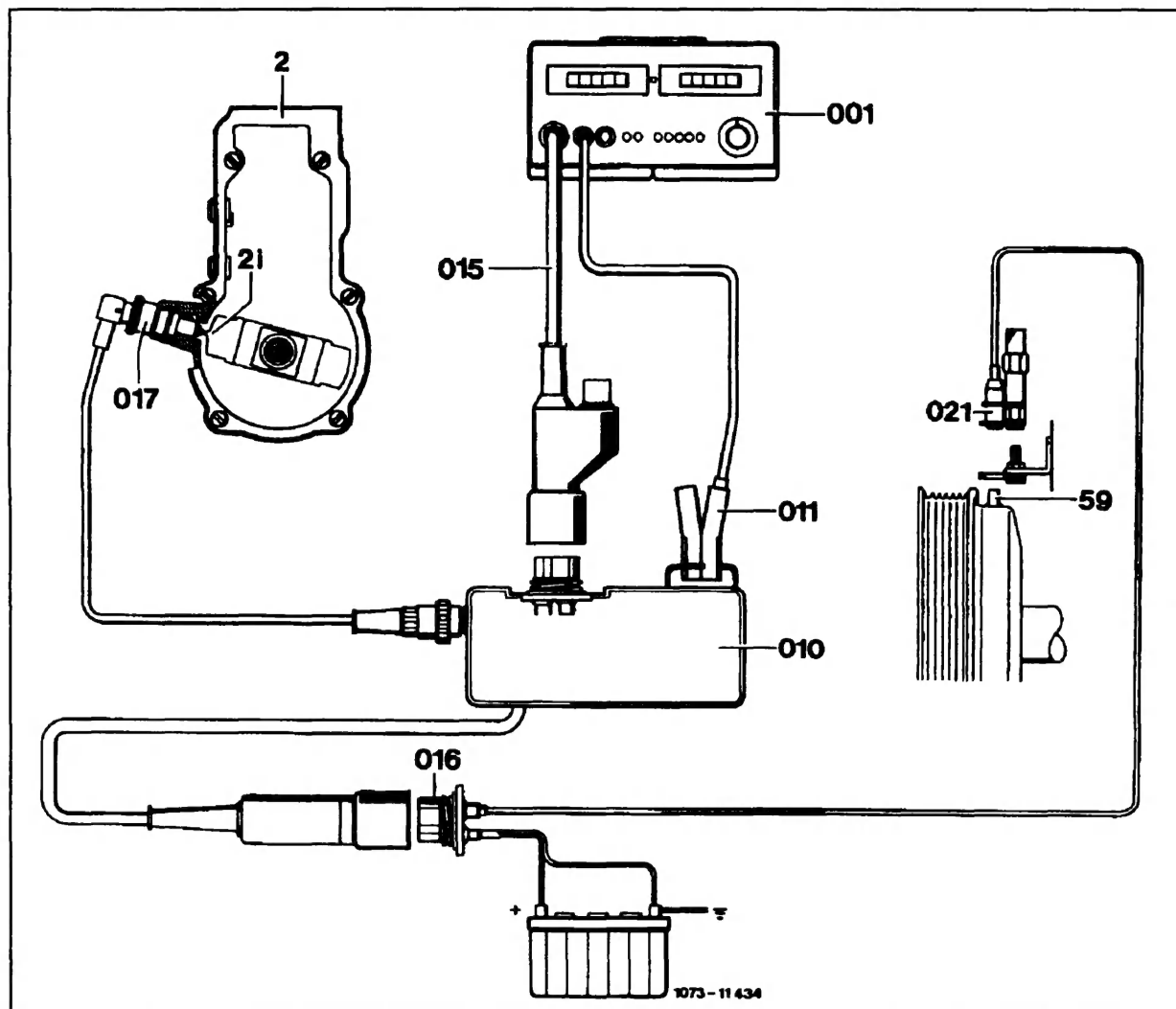
Digital testers (Diesel tester)

e.g. Bosch, ETD 019.00

e.g. Sun, DIT 9000

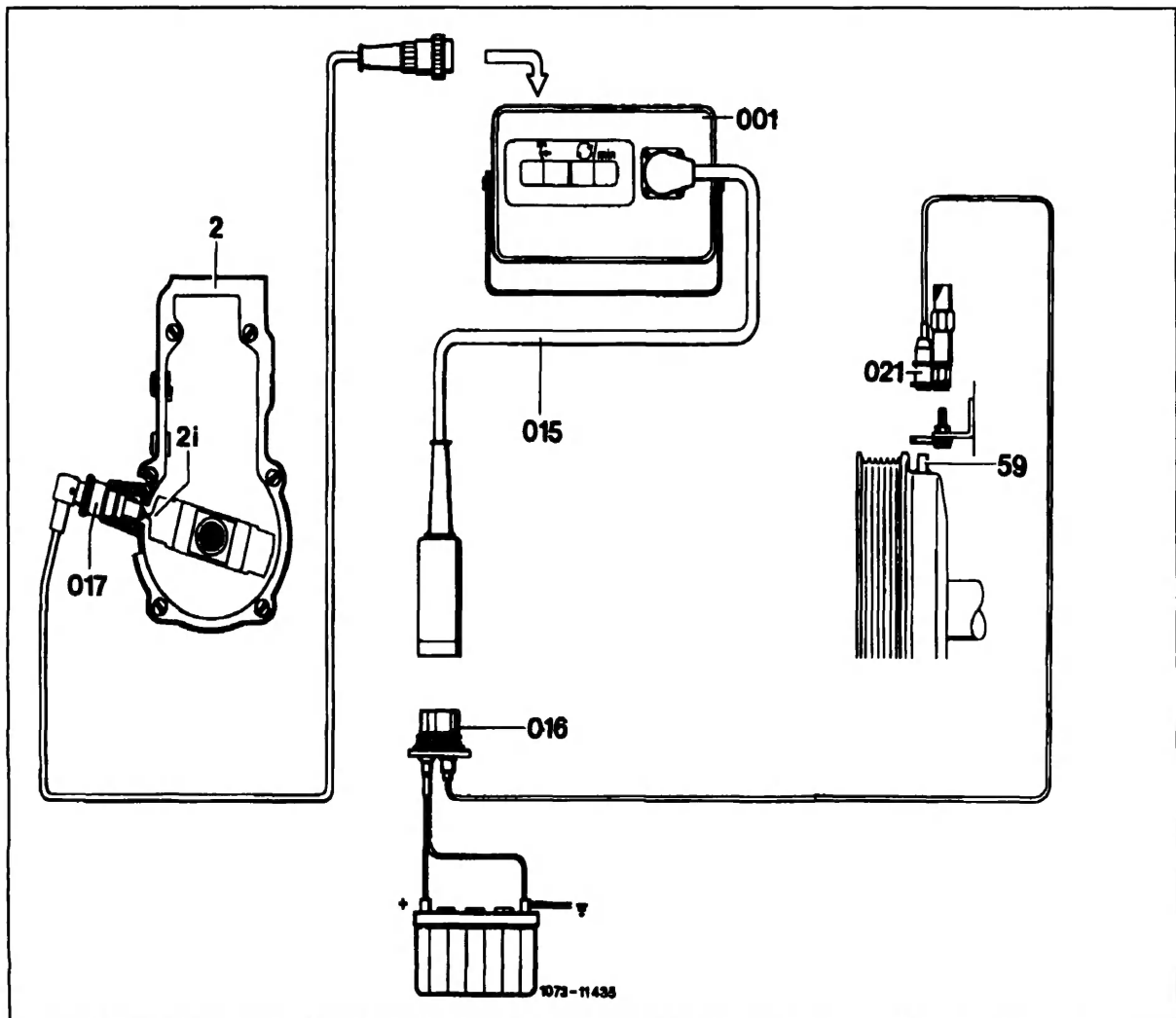
e.g. AVL, Diesel Tester 875

Connection diagram for available testers for use with adapter, e.g. Bosch MOT 001.03, Hartmann & Braun, EOMT 3



001	Digital tester	2	Governor
010	Adapter	2i	RI-transmitter pin
011	Trigger clamp	59	TDC-transmitter
015	Test cable with connector		
016	Diagnostic socket		
017	RI-transmitter		
021	TDC-impulse transmitter		

Connection diagram for testers for use without adapter,  
e.g. Bosch ETD 019.00, SUN DIT 9000, AVL Diesel-Tester 875

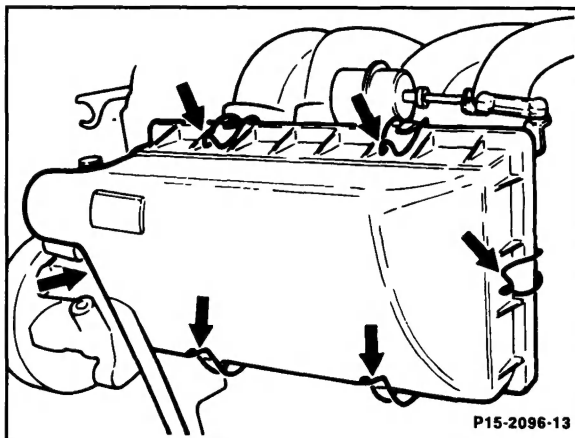


001 Digital tester  
015 Test cable with connector  
016 Diagnostic socket  
017 RI-transmitter  
021 TDC-impulse transmitter

2 Governor  
2i RI-transmitter pin  
59 TDC-transmitter

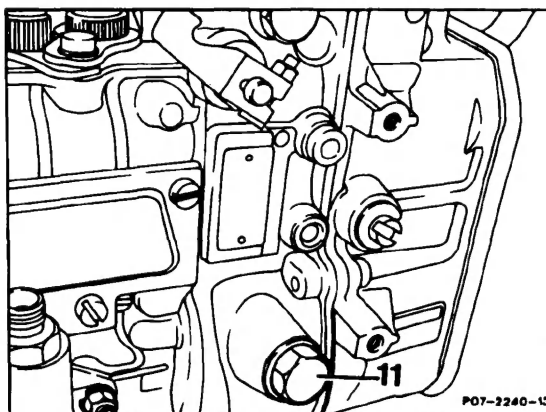
### Checking

Remove air cleaner cover (arrows).

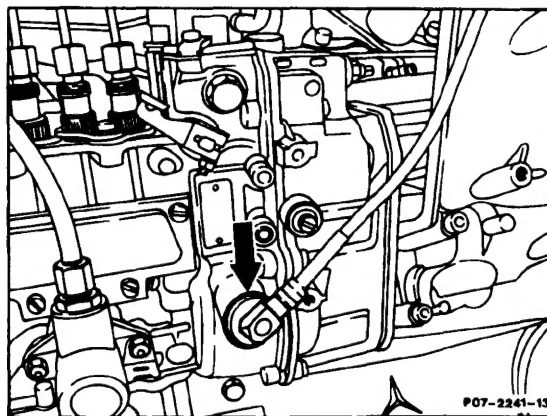


Remove plug (11) on governor.

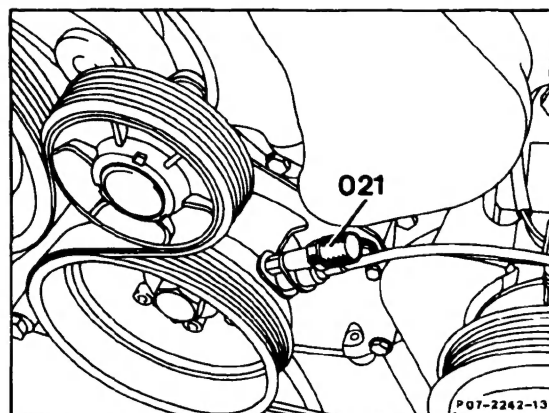
**Note:** Catch escaping oil.



Connect digital tester according to connection diagram.



017 RI-transmitter on governor (arrow)  
(injection pump)



021 TDC-impulse transmitter on holder  
Engine 601

Read RI-value (indirect injection timing) at idle speed on digital tester.

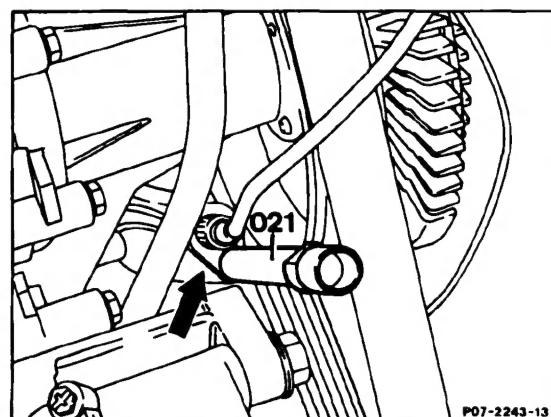
**RI-nominal value:**

15° ATDC on 1984-89 models;

14° + 0.5° ATDC on 1990 and later models.

Perform leak test with engine running.

Check engine oil level and correct, if required.



021 TDC-impulse transmitter on holder (arrow)  
Engines 602, 603